



# Estimation of the hydric state of the vegetable fuel through the use of high resolution multispectral and thermal sensors in unmanned aerial vehicles.

## Case study: Islet Yeroví of the Ecological Reserve Cotacachi – Cayapas

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**ABSTRACT** - In Ecuador, the main cause of forest fires is caused by human activity since they consider the use of fire as a work tool for land preparation, approximately at least 24,000 hectares of vegetation have been consumed by fire in recent years 20 years, where plant recovery takes decades, where it is estimated that in a square kilometer of the humid forest there are about 1250 species of plants. The study of the hydric state of the vegetable fuel, specifically the moisture content of the fuel, is considered an important variable to be taken into account in fire initiation and propagation studies, since the magnitude of this variable will directly influence the flammability of the vegetation, probability of ignition, speed of propagation and behavior of the fire, as well as the impact it will have on the islet's ecosystem. The objective of this work is to demonstrate the potential of multispectral and thermal sensors aboard unmanned aerial vehicles to detect highly flammable zones with greater probability and potential danger of starting forest fires depending on the hydrological state of the islet's vegetable fuel. A field campaign was carried out for the acquisition of plant samples of 20 native species of the islet, which served to adjust the numerical model for the estimation of the islet's water status. Finally, a water fuel model was obtained for the whole island, which allowed areas with low and high flammability to be zoned, which will allow the competent authorities to take preventive mitigation actions in case of forest fires.

**Keywords:** Fire; uav; islet; multispectral sensors; thermal sensors; fuel moisture content

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